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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,491	01/16/2007	Vesa Myllymaki	0696-0240PUS1	3826
2292 7590 12/06/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER BLAND, LAYLA D	
			ART UNIT 1623	PAPER NUMBER
			NOTIFICATION DATE 12/06/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No. 10/581,491	Applicant(s) MYLLYMAKI ET AL.	
	Examiner Layla Bland	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/2/2006, 8/29/2006, 12/5/2006</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This application is a national stage entry of International Application No. PCT/FI04/00730, filed December 2, 2004, which claims priority to Finnish Application No. 20031763, filed December 3, 2003. Claims 1-18 are pending in this application and are examined on the merits herein.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 7 and 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 7 recite the limitation "pseudohalogen." Preferred pseudohalogens are given in the specification, but absent a definition it is unclear which groups are pseudohalogens and which are not; thus, it is impossible to determine the metes and bounds of the claim.

Claims 16-18 recite the limitation "non-solvent." Preferred embodiments of "non-solvent" are given in the specification, but absent a definition it is unclear which compounds are considered non-solvents and which are not; thus, it is impossible to determine the metes and bounds of the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nobuo et al. (JP 2002-003478, January 9, 2002, machine translation) and Swatloski et al. (WO 03/029329, April 10, 2003, PTO-1449 submitted August 29, 2006) in view of Brandt et al. (Ullmann's Encyclopedia of Chemical Technology, Vol. 2, pp 221-234 (2001), PTO-1449 submitted December 5, 2006).

Nobuo et al. teach a method of modifying sugars and polysaccharides using an ionic liquid in combination with water sensitive reagents such as acid halides and acid anhydrides [0031]. Ionic liquids solubilize macromolecules and biopolymers [0001] and are known in the art; for example, ionic liquids comprising N-dialkyl imidazolium ion [0003].

Nobuo et al. do not teach the use of microwave irradiation and do not teach modifications of cellulose in particular.

Swatloski et al. teach the dissolution of cellulose in ionic liquids using microwave heating [page 19, first full paragraph]. Ionic liquids comprising chloride anions and imidazolium cations were most effective [page 29, last two paragraphs]. Exemplary ionic liquid cations, molten at a temperature of less than about 150°C [pages 10 and 11], include the cations shown in claims 5-7 of the instant application. Cellulose can be

dissolved for derivatization [page 18, last sentence] and regenerated in a number of forms from the solution by mixing with water, ethanol, or acetone [page 28, first full paragraph].

Swatloski et al. do not teach etherification of cellulose.

Neither Nobuo et al. nor Swatloski et al. teach reaction conditions for the preparation of cellulose ethers.

Brandt et al. teach etherification of cellulose using R-X compounds such as methyl chloride or sodium chloroacetate, epoxides, acrylic compounds, or diazoalkanes in the presence of OH^- [page 463, reaction equations]. In the case of lower alkyl chlorides or epoxides, the reaction is carried out in autoclaves at a pressure of about 3 MPa [page 467, 2.3].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to etherify cellulose using the ionic liquids taught by Nobuo et al. and Swatloski et al. in the presence of base and etherifying agents as taught by Brandt et al. Derivatization of polysaccharides using acid halides or acid anhydrides in ionic liquids is known in the art, as taught by Nobuo et al. The skilled artisan could have used the guidance provided by Swatloski et al. and Brandt et al. to optimize conditions for etherification of cellulose in ionic liquids.

A reference is good not only for what it teaches by direct anticipation but also for what one of ordinary skill in the art might reasonably infer from the teachings. (*In re Opprecht* 12 USPQ 2d 1235, 1236 (Fed Cir. 1989); *In re Bode* 193 USPQ 12 (CCPA) 1976). In light of the forgoing discussion, the Examiner concludes that the subject

matter defined by the instant claims would have been obvious within the meaning of 35 USC 103(a). From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Layla Bland whose telephone number is (571) 272-9572. The examiner can normally be reached on M-R 8:00AM-5:00PM UST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on (571) 272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:
10/581,491
Art Unit: 1623

Page 6

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Layla Bland
Patent Examiner
Art Unit 1623
November 28, 2007

Shaojia Anna Jiang

A handwritten signature in black ink, appearing to read 'SJD 12/3/07', is written over the printed name and title.

Supervisory Patent Examiner
Art Unit 1623
November 28, 2007